

CLAIMS

We claim:

5 1. A composition comprising a nucleic acid sequence selected from the
group consisting of 340, 345, 347, 350, 352, 358, 364, 366, 368, 373, 375, 379, 383, 387,
391, 395, 399, 401, 405, 407, 409, 411, 415, 417, 419, 423, 426, 428, 431, 435, 439, 443,
445, 447, 449, 452, 454, 455, 459, 463, 467, 471, 475, 481, 484, 495, 497, 499, 501, 505,
509, 513, 517, 521, 525, 529, 533, 537, 541, 543, 549, 552, 559, 563, 565, 567, 571, 573,
10 575, 577, 579, 581, 583, 585, 587, and 589 and the complements thereof.

2. A vector comprising the nucleic acid sequence of Claim 1.

3. A host cell comprising the vector of Claim 2.

15 4. A composition comprising a polypeptide encoded by a nucleic acid
selected from the group consisting of SEQ ID NO:340, 345, 347, 350, 352, 358, 364,
366, 368, 373, 375, 379, 383, 387, 391, 395, 399, 401, 405, 407, 409, 411, 415, 417, 419,
423, 426, 428, 431, 435, 439, 443, 445, 447, 449, 452, 454, 455, 459, 463, 467, 471, 475,
20 481, 484, 495, 497, 499, 501, 505, 509, 513, 517, 521, 525, 529, 533, 537, 541, 543, 549,
552, 559, 563, 565, 567, 571, 573, 575, 577, 579, 581, 583, 585, 587, and 589.

5. The composition of Claim 4, wherein said polypeptide is selected from the
group consisting of SEQ ID NO: 341, 346, 348, 351, 353, 359, 365, 367, 369, 374, 376,
25 380, 384, 388, 392, 396, 400, 402, 406, 408, 410, 412, 416, 418, 420, 424, 427, 429, 432,
436, 440, 444, 446, 448, 450, 456, 460, 464, 468, 472, 476, 482, 485, 488, 491, 494, 496,
498, 500, 502, 506, 510, 514, 518, 522, 526, 530, 534, 538, 542, 544, 550, 553, 560, 564,
566, 568, 572, 574, 576, 578, 580, 582, 584, 586, 588, and 590.

6. A method for producing an altered enzyme with improved functionality in a nucleic acid cleavage assay comprising:

a) providing:

i) a polypeptide comprising a sequence selected from the group consisting of SEQ ID NO:340, 345, 347, 350, 352, 358, 364, 366, 368, 373, 375, 379, 383, 387, 391, 395, 399, 401, 405, 407, 409, 411, 415, 417, 419, 423, 426, 428, 431, 435, 439, 443, 445, 447, 449, 452, 454, 455, 459, 463, 467, 471, 475, 481, 484, 495, 497, 499, 501, 505, 509, 513, 517, 521, 525, 529, 533, 537, 541, 543, 549, 552, 559, 563, 565, 567, 571, 573, 575, 577, 579, 581, 583, 585, 587, and 589;

ii) a nucleic acid encoding a polypeptide comprising a sequence selected from the group consisting of SEQ ID NO:340, 345, 347, 350, 352, 358, 364, 366, 368, 373, 375, 379, 383, 387, 391, 395, 399, 401, 405, 407, 409, 411, 415, 417, 419, 423, 426, 428, 431, 435, 439, 443, 445, 447, 449, 452, 454, 455, 459, 463, 467, 471, 475, 481, 484, 495, 497, 499, 501, 505, 509, 513, 517, 521, 525, 529, 533, 537, 541, 543, 549, 552, 559, 563, 565, 567, 571, 573, 575, 577, 579, 581, 583, 585, 587, and 589; and

iii) a nucleic acid test substrate;

b) introducing one or more heterologous domains into said nucleic acid to produce an altered nucleic acid encoding an altered enzyme;

c) contacting said altered enzyme and said polypeptide with said nucleic acid test substrate to produce cleavage products; and

d) comparing cleavage products produced by said altered enzyme to cleavage products produced by said polypeptide.

7. A composition comprising a nucleic acid, said nucleic acid comprising sequence of SEQ ID NO:543.

8. A composition comprising a polypeptide, said polypeptide comprising SEQ ID NO:544.